

FACT SHEET FOR NPDES PERMIT WA-002276-4
SOUTHWEST SUBURBAN SEWER DISTRICT
MILLER CREEK WASTEWATER TREATMENT PLANT

SUMMARY

- Both the acute and chronic mixing zones were decreased slightly based on the depth of the outfall; and in accordance with information provided in the Engineering Report submitted by Southwest Suburban Sewer District and approved by the Department.
- The acute dilution ratio increased and the chronic dilution ratio decreased based on calculation provided in the Engineering Report.
- The requirement for copper monitoring was removed from the permit based on the reasonable potential calculation.
- The monitoring frequency for both BOD₅ and TSS was increased from 1/week to 2/week to comply more closely with the guideline of 3/week as written in the Department's *Permit Writer's Manual* and to align with the facilities actual sample frequency during the previous permit cycle.
- Mass discharge limitations for BOD₅ and TSS were increased by 16% based on the increase in the Maximum Monthly Average Daily Flow per the new design criteria.
- Whole Effluent Toxicity for both acute and chronic is required for the purpose of characterization of the effluent prior to permit renewal at the end of the permit cycle.
- Waste characterization, according to the NPDES application part D requirements, is due in the fourth year of the permit cycle in order to provide information on compliance with human health criteria for the future permit. Refer to Appendix D for a complete list of these testing requirements.
- The Department requires that the *Operations and Maintenance Manual* be reviewed and updated during the second year of the permit cycle.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC), water quality criteria for surface and ground waters (chapters 173-201A and 200 WAC), and sediment management standards (chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—Public Involvement of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix E—Response to Comments.

GENERAL INFORMATION	
Applicant Information	Southwest Suburban Sewer District 431 Ambaum Boulevard SW Burien, WA 98166
Contact Person	William T. Skahan, General Manager (206) 244-9575
Facility Name and Address	Miller Creek Wastewater Treatment Plant 1015 SW 174 th Place Normandy Park, WA 98166
Facility Contact	Ron Daninger, Senior Operator (206) 244-2202
Type of Treatment	Secondary Biological Treatment – Rotating Biological Contactors
Discharge Location	Puget Sound – East Passage Latitude: 47° 26' 30" N Longitude: 122° 21' 52" W
Water Body ID Number	WA-PS-0270

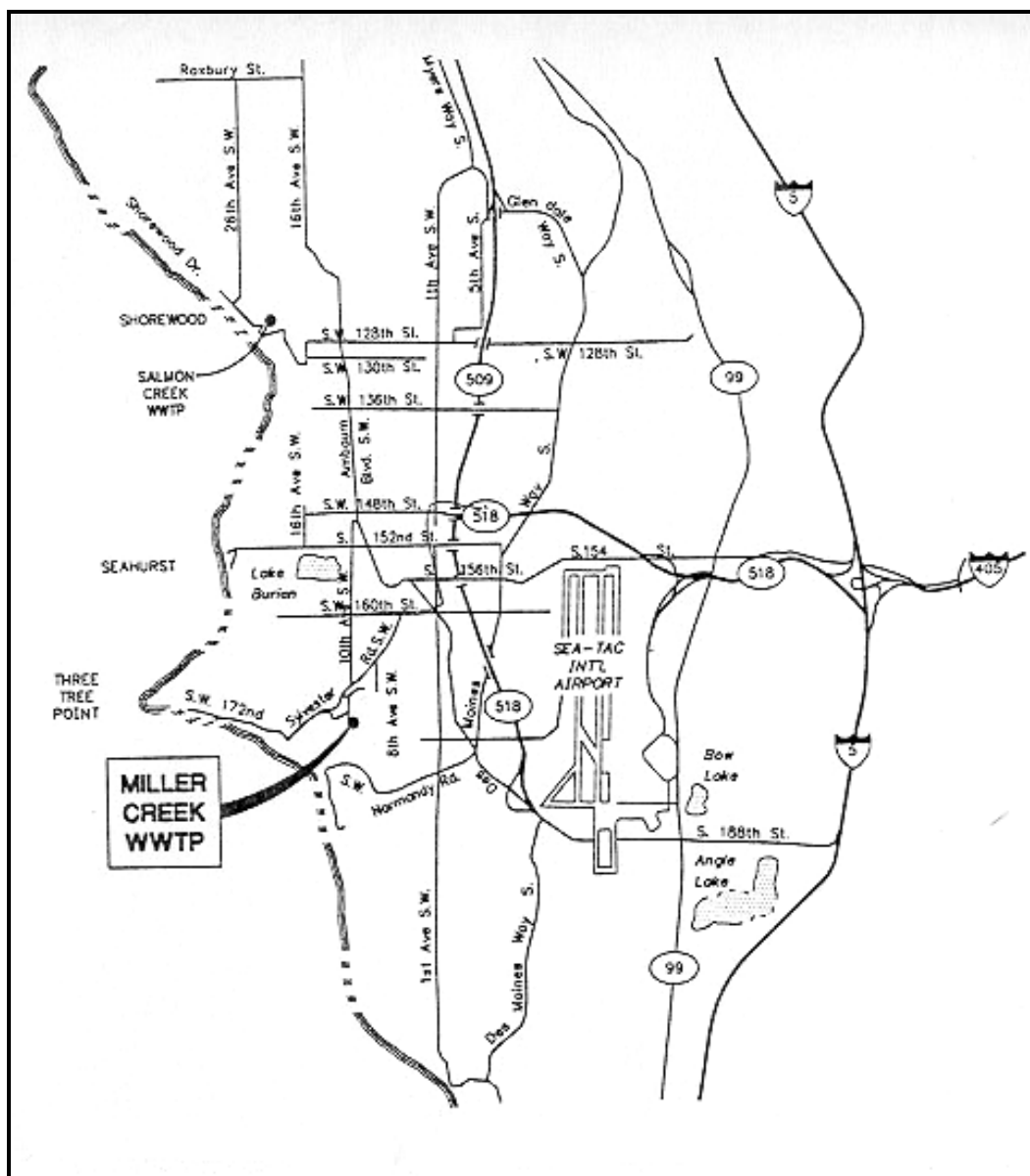


Figure 1: Vicinity map showing location of Miller Creek WWTP in Burien, WA



DESCRIPTION OF THE FACILITY

Miller Creek Wastewater Treatment Plant (WWTP) is operated by Southwest Suburban Sewer District (SWSSD) which was established in 1945 to serve the region in Southwest King County. Original construction of the Miller Creek WWTP began in 1965 and was completed in 1967 with the start up of the facility. The original facility included bar screens, grit channels, two digesters, two primary clarifiers, and an operations building. The first upgrade came in 1972 with the addition of two additional clarifiers and two solids contact chambers. Secondary treatment was added in 1985 with the construction of rotating biological contactors (RBC) and two secondary clarifiers. A compost facility was added in 1990. The installation of an odor scrubbing system for the secondary treatment was completed in late 1991. Upgrades to the facility in late 2002 include improvements in the headworks with the installation of 1/4" fine step screens and improved grit removal, and the installation of addition RBC capacity to meet future flow demands.¹ Miller Creek WWTP is an EPA major facility.

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COLLECTION SYSTEM STATUS

The Miller Creek drainage basin is approximately 6300 acres. The collector/interceptor system includes 160 miles of piping, ranging from 4 inches to 36 inches in diameter.² Portions of the collection system date to the 1940's. SWSSD has 11 pump stations of which 7 pump to Miller Creek WWTP. Pump capacity has been deemed sufficient and adequately designed as outlined in the Comprehensive Sewer Plan 1999 ("CSP").³

The CSP details flow projections in SWSSD over the next nearly 20 years based on expected demographic changes in the district. CSP projects Miller Creek WWTP to have a flow (mean annual, MGD) increase of approximately 52% from basis year 1996 to year 2020.⁴ Plant improvements in 2002, outfall replacement in 2003, and other continuous improvement projects will accommodate this anticipated flow increase.

The CSP used flow data from 1991 to 1996 to evaluate inflow and infiltration (I/I) attributed to direct storm runoff. I/I flow for Miller Creek basin is 29% which equates to 1.05 gallons per day per foot of sewer line.⁵ There are minimal plans for I/I rehabilitation during this permit cycle.

Miller Creek WWTP does not have a combined sewer overflow (CSO).

TREATMENT PROCESSES

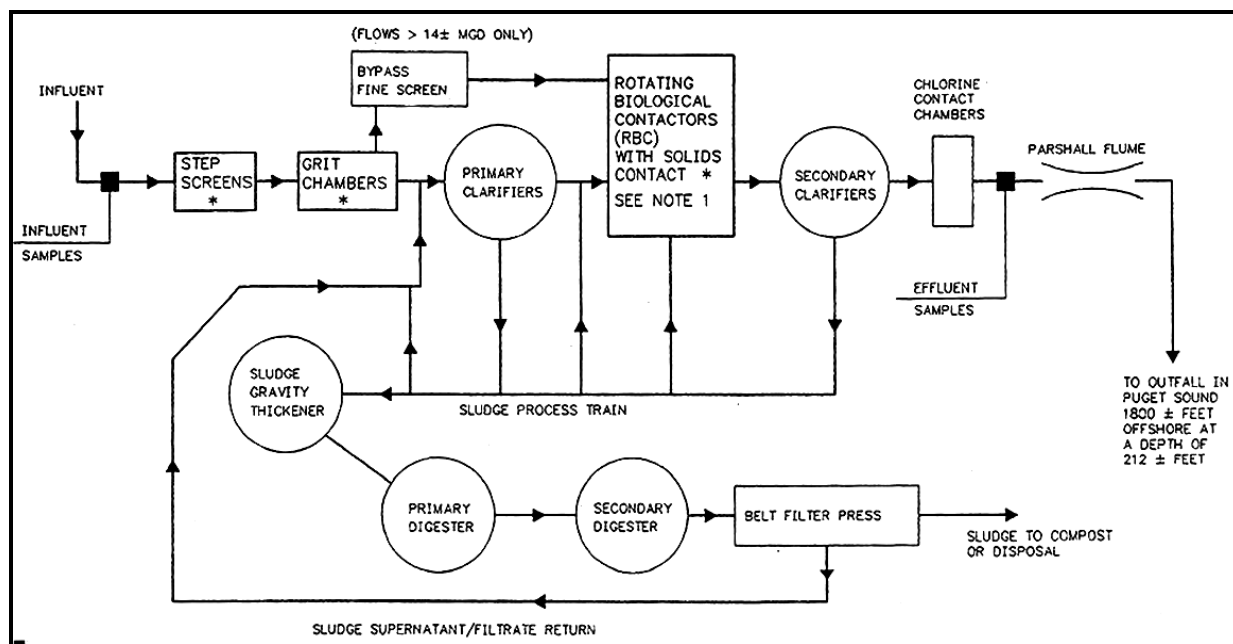


Figure 3. Process Flow Diagram – Miller Creek WWTP

² Horton, Dennis and Associates; Kirkland, WA; Southwest Suburban Sewer District, 1999 Comprehensive Sewer Plan; February 1999; p. 48.

³ Horton, CSP, p. 68.

⁴ Horton, CSP, p. 50.

⁵ Horton, CSP, p. 42.

(Refer to Figure 3.) The influent wastewater enters the treatment plant and passes in parallel through two 1/4" fine step screens to remove rags and debris. Next, the wastewater flows in parallel through two vortex circular grit chambers where the heavier grit is allowed to settle out of the wastewater. In addition, a rotating fine screen can be placed on-line during periods of high flow. The wastewater overflows from the grit channels and then flows through four primary settling tanks. The next step is secondary treatment which consists of six tanks with each tank containing five rotating biological contactors (RBC). The wastewater then flows in parallel into two secondary settling tanks. Sodium Hypochlorite is injected into the secondary effluent prior to the effluent entering two final serpentine tanks. The serpentine tanks provide added contact time required for effective disinfection of the effluent. (Sludge handling is discussed under the heading of Residual Solids, page five.)

The Permittee lists no industrial users in the permit application and has not received any industrial wastewater during the previous permit. It does not foresee receiving any industrial wastewater during this permit cycle.

Miller Creek WWTP is designated as a Class 3 WWTP under State regulations. The permit requires that the sewage treatment plant operator in charge of operations be Class 3 certified. The plant employs six operators, one additional temporary operator, and three maintenance workers. The plant is staffed ten hours per day, seven days per week. Two out of the six operators work primarily in the compost area.

Emergency operating procedures are adequately outlined in the *Operations and Maintenance Manual*, and all operators are appropriately trained in those procedures.

Improvement plans for 2002 and 2003 are funded by the Public Works Trust Fund. The improvement plans for 2002 include changes to screening, grit removal, air blower, and an increase in RBC capacity. The plans to 2003 include replacement of the marine portion of the outfall pipe.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility via the effluent pipe into Puget Sound. The existing outfall pipe was installed in 1966. It consists of 3,176 lineal feet (lf) of 36-inch diameter concrete pipe, 1,341 lf of 30-inch concrete pipe, and 680 lf of 30-inch corrugated metal pipe (CMP). All of the upland and intertidal sections of pipe are buried. The CMP portion begins near the drop-off in Puget Sound. The concrete-to-CMP transition is buried, but the CMP below -53 feet Mean Lower Low Water (MLLW) datum is laid on the bottom in Puget Sound. The outfall terminates with an open-ended pipe at -200 feet MLLW.

A video inspection of the marine portion of the outfall was conducted in 1995. A dive inspection was completed in May of 2000.⁶ The portion of the CMP pipe was visually inspected from -53 feet MLLW to a depth of -116 feet MLLW for a total of 220 lf of pipe. Fluorescent dye was injected into the outfall to assist with leak detection. This inspection revealed numerous leaks in the marine portion of the outfall pipe. SWSSD has plans to replace the marine portion of the CMP pipe with 36" ID high density polyethylene (HDPE) in mid-2003. The Engineering Study has determined that the proposed larger diameter, smooth-wall pipe will allow Miller Creek WWTP to meet future increases in flow.⁷

⁶ Evan Henke P.E., CHS Engineering Inc., Waste Water Treatment Plant, Engineering Report, WWTP Improvements, February 2001, pp. 2-3.

⁷ Henke, Engineering Report, p.18.

RESIDUAL SOLIDS

The treatment facility removes solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local landfill.

Solids removed from the primary and secondary clarifiers are treated first by pumping to a gravity thickener to increase the percent of solids and thereby improve filterability of the solids. (Refer to Figure 3) The sludge is pumped to a primary anaerobic mesophilic digester with a hydraulic retention time of greater than 15 days. The digested sludge is dewatered using Parkson® belt filter presses (2). All the filtrate and other liquid waste streams from the facility are returned to the headworks for treatment.

The majority of the filter solids (Class B biosolids) are land applied under permit number BA-002276-4. In addition, a portion of the dewatered biosolids are mixed with tree chippings and composted in aerated static piles for Class A biosolids which are screened and sold to the public.⁸

The monitoring results for pollutant metals in sludge as required by 40 CFR 503 are shown in Table 1. The sludge generated at the facility meets the exceptional quality standards set forth by federal regulations. In all cases, the average pollutant concentrations are below the standard.

Table 1. Biosolids Pollutant Concentrations (mg/kg)

Pollutant	Analytical Method	DL	11-Jan-00	11-Apr-00	11-Jul-00	17-Oct-00	24-Jan-01	8-May-01	26-Jul-01	18-Oct-01	Ave.	Standard
Arsenic	SW-846 7060A	0.10	5.3	0.3	1.9	5.2	0.26	0.54	2.0	3.1	2.3	41
Cadmium	SW-846 6010	0.05	2.5	2.3	3.9	12.0	3.4	2.6	2.7	3.0	4.1	39
Chromium	SW-846 6010	0.10	19.0	21.0	23.0	28.0	18.0	19.0	20.0	19.0	21	
Copper	SW-846 6010	0.10	420.0	390.0	440.0	410.0	430.0	370.0	420.0	380.0	408	1500
Lead	SW-846 6010	1.00	100.0	92.0	72.0	50.0	84.0	69.0	58.0	58.0	73	300
Mercury	SW-84 7471A	0.01	0.88	0.62	2.40	<2.6	2.30	1.80	2.70	1.20	1.7	17
Molybdenum	SW-846 6010	0.50	8.0	5.4	13.0	17.0	5.7	5.2	9.1	12.0	9.4	18
Nickel	SW-846 6010	0.50	18.0	14.0	19.0	21.0	17.0	13.0	19.0	15.0	17	420
Selenium	SW-846 7740	0.10	1.0	2.1	3.0	2.2	3.5	0.2	0.1	4.0	2.0	100
Zinc	SW-846 6010	0.10	1100	730	1000	890	1100	950	1100	990	983	2800
Total Kjeldahl Nitrogen	EPA 351.3	5	64700	47100	55000	66700	61000	56000	61000	62000	59188	
Ammonia	SM 4500NH3	5	17600	15200	12000	15600	18000	14000	16000	13000	15175	
N02+N03	EPA 351.2	0.05	2.20	3.00	1.20	3.40	<3	N/A	1.10	3.10	2.0	

⁸ NPDES Form 2S Application Overview

PERMIT STATUS

The previous permit for this facility was issued on June 23, 1997, and became effective on July 1, 1997. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and Total Residual Chlorine (TRC).

An application for permit renewal was submitted to the Department on April 4, 2002, and accepted by the Department on April 29, 2002. An extension of the previous permit was granted as of June 23, 2002, and will remain in effect until the effective date of this permit.

Table 2. Previous Permit Limits

EFFLUENT LIMITATIONS^a: OUTFALL # 001		
Parameter	Average Monthly	Average Weekly
Biochemical Oxygen Demand ^b (5 day)	30 mg/L, 1535 lbs./day	45 mg/L, 2300 lbs./day
Total Suspended Solids ^b	30 mg/L, 1535 lbs./day	45 mg/L, 2300 lbs./day
Fecal Coliform Bacteria	200 cfu/100 mL	400 cfu/100 mL
pH	shall not be outside the range 6.0 to 9.0	
Interim Total Residual Chlorine ^c	0.5 mg/L, 25.6 lbs./day	0.75 mg/L
Parameter	Average Monthly	Maximum Daily
Total Residual Chlorine ^c	0.15 mg/L, 7.7 lbs./day	0.39 mg/L
^a The average monthly and weekly effluent limitations are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.		
^b The average monthly effluent concentration for BOD ₅ and Total Suspended Solids shall not exceed 30 mg/L or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.		
^c The Permittee shall comply with the Total Residual Chlorine limitation by June 30, 2002. Until that time, the Interim Total Residual Chlorine Limitation shall apply to the discharge.		

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

Miller Creek WWTP received two Class I inspections by the Department during the previous permit on the dates of June 26, 1998, and May 3, 2001. The last inspection showed the facility to be in good order. The inspector recommended that staffing should be reviewed to ensure that it is adequate based on EPA criteria.⁹

During the history of the previous permit, the Permittee has remained in complete compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. All reported effluent and influent data were reviewed for the 5-year period from July 1997 to July 2002. The only compliance related concern occurred in late 1998 when the facility exceeded 85% of the design criteria for influent flow for three consecutive months. This indicates that the facility needs to investigate the need for the expansion. The 1999 CSP and the 2001 Engineering Report both address this concern (Refer to Table 3: 5-Year Summary of Noncompliance). A complete 5-year summary of DMR data is listed in Appendix C. Table 1: Summary of DMR Influent Data and Table 2: Summary of DMR Effluent Data.

⁹ Ed Abassi, Water Compliance Inspection Report, 5/3/02

Table 3: DMR Compliance Summary, July 1997 to July 2002.

Date	Parameter	Limit	Reported Value	Comment
Dec. - 98	Influent Flow exceeded 85% of design flow for 3 consecutive months.	5.2 MGD	5.6	High inflow and infiltration due to excessive rainfall.
Jan. - 99			5.4	
Feb. - 99			5.8	

*WASTEWATER CHARACTERIZATION***DMR 5-YEAR SUMMARY**

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows, as summarized from Discharge Monitoring Report 5-year Summary (Appendix C). In all cases, the 5-year average for each pollutant is below the limit.

Table 4: Wastewater Characterization (5-year Summary)

Pollutant/Analysis	Units		Design Criteria	Limits	5-year Average	Minimum.	Maximum
BOD, 5	LBS/DAY	AVG		1535	392	94	940
BOD, 5	LBS/DAY	AVW		2300	555	185	1621
BOD, 5	MG/L	AVG		30	12.7	5.8	24.1
BOD, 5	MG/L	AVW		45	16.1	6.5	33.1
BOD, 5 % removal	PERCENT	AVG		85	94.4	86.0	97.0
CL	LBS/DAY	AVG		25.6	7.09	2.90	14.60
CL	MG/L	AVG		0.5	0.23	0.11	0.40
CL	MG/L	MAX		0.75	0.30	0.12	0.48
COLI. FECAL	#/100 ML	GEM		200	12	1	34
COLI. FECAL	#/100 ML	GM7		400	29	2	118
Cu	MG/L	AVG		NA	0.011	0.004	0.024
FLOW, IN	MGD	AVG	6.13	5.2	3.62	2.87	5.83
FLOW, IN	MGD	MAX		NA	5.11	3.27	12.40
PH	S.U.	MAX		9	7.3	6.9	7.6
PH	S.U.	MIN		6	6.8	6.4	7.2
TSS % removal	PERCENT	AVG		85	95.7	87.0	98.0
TSS	LBS/DAY	AVG		1535	226	94	653
TSS	LBS/DAY	AVW		2300	331	100	1057
TSS	MG/L	AVG		30	7.2	3.7	16.6
TSS	MG/L	AVW		45	9.3	4.3	22.7

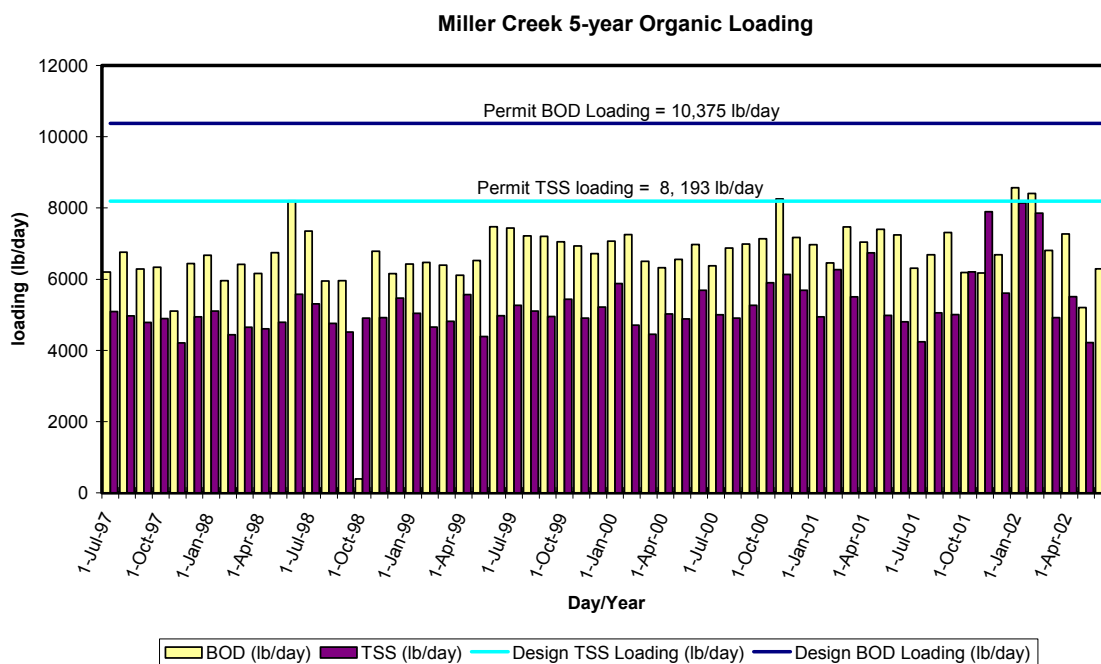
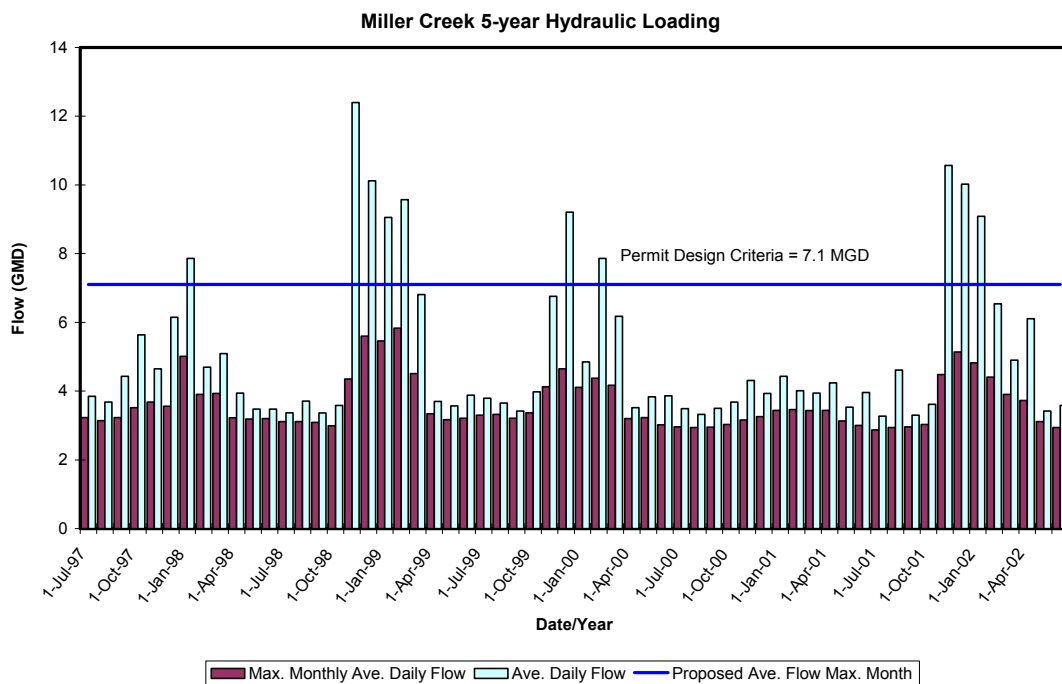


Figure 4: Miller Creek Hydraulic and Organic Loading 1/1997 to 1/2002 vs. Proposed Permit Limits

Hydraulic loading has remained consistent over the term of the previous permit. Organics and solids loading have remained well below the proposed permit limits of this permit. Both of the above graphs display that the Permittee is able to operate the facility within the design criteria upon which this permit is based.

PRIORITY POLLUTANTS

The Permittee characterized the effluent for priority pollutant metals during the last permit cycle. The data was analyzed to determine if there is a reasonable potential to violate state water quality standards for any of the pollutants listed in Table 5. Calculations for Reasonable Potential are shown in Appendix C. Based on these calculations, none of the pollutants listed below have a reasonable potential to exceed water quality standards.

Table 5: Priority Pollutants Analysis (all units in mg/l)

Parameter	Method	DL	5/31/01	8/28/01	10/18/01	1/29/02	Average
Antimony	200.7	0.01	0.01	0.01	0.01	0.01	< 0.01
Arsenic	206.2	0.001	0.001	0.001	0.001	0.001	< 0.001
Beryllium	200.7	0.0005	0.0005	0.0005	0.0005	0.0008	< 0.00058
Cadmium	200.7	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005
Chromium	200.7	0.001	0.001	0.001	0.001	0.005	< 0.002
Copper	200.7	0.001	0.009	0.007	0.007	0.007	0.0075
Lead	239.2	0.001	0.002	0.001	0.008	0.001	0.003
Mercury	245.1	0.0002	0.0002	0.0002	0.0002	0.0002	< 0.0002
Nickel	200.7	0.005	0.005	0.005	0.005	0.005	< 0.005
Selenium	270.2	0.001	0.001	0.001	0.001	0.002	< 0.00125
Silver	200.7	0.01	0.01	0.01	0.01	0.01	< 0.01
Thallium	279.2	0.001	0.001	0.001	0.001	0.001	< 0.001
Zinc	200.7	0.001	0.042	0.029	0.044	0.040	0.03875

WHOLE EFFLUENT TOXICITY TESTING

The Permittee performed acute and chronic toxicity characterization in accordance to the previous permit requirements (S8. and S9., respectively). Table 6 is a summary of the test results. As determined by the Department's WET Coordinator, the Permittee passed all WET test with the exception of the January 25, 2001, acute test using the fathead minnow. A fungus growth may have interfered with the test as noted by the contract laboratory. The Permittee repeated and passed an acute test using the fathead minnow on March 13, 2001. The Department accepted the results of the repeat test. The Permittee has demonstrated some toxicity but not at a level of regulatory concern. For that reason, no WET limit is placed in this permit. Due to the anomalous acute result of the January 25, 2001 test, WET characterization will be required in this permit to provide data prior to the next permit issuance.

Table 6: Whole Effluent Toxicity (WET) Testing

Date Report Submitted	Type of Test	Sample Dates (24-hour composite samples)	Specie Type	Summary of Results
August 15, 2000	Chronic	July 10, 12, 15, 17, 2000	Topsmelt: PASS	
			Survival	NOEC = 50%
				LOEC = 100%
			Growth	NOEC = 50%
				LOEC = 100%
			Mysidopsis bahia: PASS	
			Survival	NOEC = 50%
				LOEC = 100%
			Growth	NOEC = 12.5%
				LOEC = 25%
	Acute	July 10, 2000	Fathead minnow: PASS	LC50 = >100%
			Daphnia pulex: PASS	LC50 = >100%
March 15, 2001	Chronic	Jan. 23, 25, and 27, 2001	Topsmelt: PASS	
			Survival	NOEC = 100%
				LOEC = >100%
			Weight	NOEC = 100%
				LOEC = >100%
			Mysidopsis bahia: PASS	
			Survival	NOEC = 100%
				LOEC = >100%
			Weight	NOEC = 50%
				LOEC = 100%
	Acute	January 25, 2001	Fathead minnow: FAIL	NOEC = 25%
				LC50 = 67%
			Daphnia pulex: PASS	NOEC = 100%
				LC50 = >100%
April 15, 2001	Acute	March 13, 2001 (follow up to January 25 test due to fungal interference.)	Fathead minnow: PASS	NOEC = 100%

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances, the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria are given in the Miller Creek Wastewater Treatment Plant Engineering Report approved by the Department on June 21, 2001, as follows:

Table 7: Design Standards for Miller Creek WWTP¹⁰

Parameter	Existing	After 2002	2020 (permit basis)
Design Population Equivalent	30,119	30,119	41,008
Annual Average Daily Flow (AADF)	3.9	3.9	4.9
Maximum Monthly Average Daily Flow (MMDF)	5.9	5.9	7.1
Peak Hour Flow (PHF)	19.6	19.6	21.75
BOD ₅ , lbs./day, MMDF	7,620	7,620	10,375
TSS, lbs./day, MMDF	6,018	6,018	8,193
Plant Design			
Primary Sedimentation Tanks	4	4	4
Total Number of RBC shafts	24	30	30
Secondary Clarifiers	2	2	2

¹⁰ Evan Henke P.E., CHS Engineering Inc., 2002 Miller Creek/Salmon Creek WWTP Improvements Design Criteria and Site Plan, May 2002, sheet 2 of 31.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from chapter 173-221 WAC are:

Table 8: Technology-based Limits.

Parameter	Limit
pH	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

For BOD₅ and TSS:

Monthly effluent mass loadings (lbs./day) were calculated as the maximum monthly design flow (7.1 MGD) x concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit **1776** lbs./day.

The weekly average effluent mass loading is calculated as (7.1 MGD) x concentration limit (45 mg/L) x 8.34 (conversion factor) = mass limit **2665** lbs./day.

For Chlorine:

The chlorine limit is water quality-based, refer to Appendix C, Table 6: Water quality-based permit calculation. Refer to section titled "Consideration of Surface Water Quality-Based Limits for Numeric Criteria."

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in the receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA, 1992). These criteria are designed to protect humans from cancer and other diseases and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control, and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Puget Sound which is designated as a Class AA receiving water in the vicinity of the outfall. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating, and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable water quality criteria for class AA are defined in chapter 173-201A-030 WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	7 mg/L minimum
Temperature	13 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C, Table 5 for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in chapter 173-201A-100 WAC and are defined as follows:

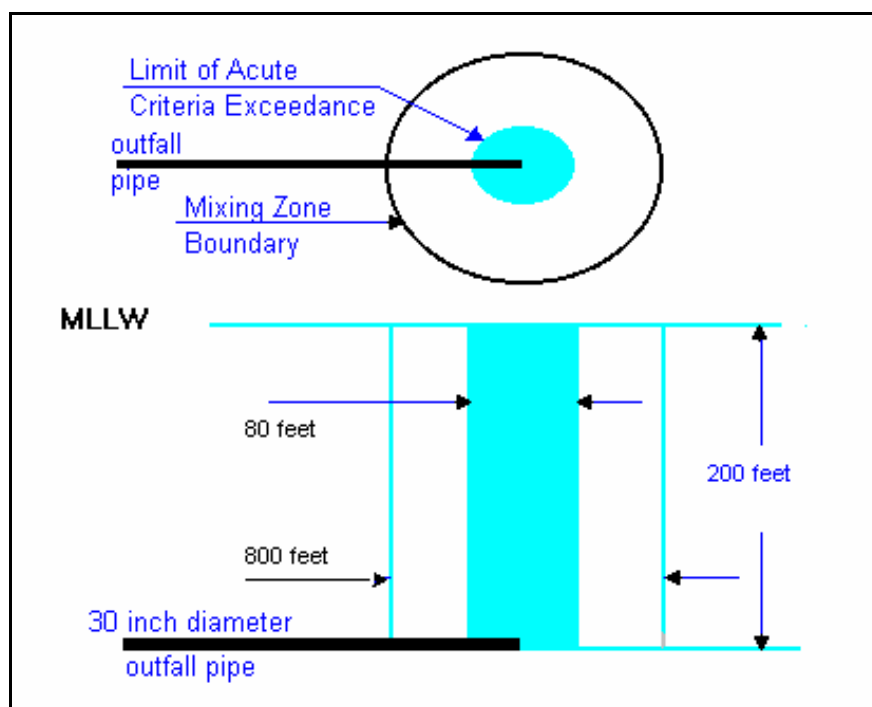


Figure 5: Schematic diagram of the mixing zone.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of two computer models, UDKHDEN for acute conditions and PLUMES for chronic conditions. The dilution factors have been determined to be¹¹:

	Acute	Chronic
Aquatic Life	54.8	458.1
Human Health, Carcinogen		458.1
Human Health, Non-carcinogen		458.1

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD₅--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water varies from 8° C to 12.5° C and the effluent temperature varies from 10° C to 20° C. The discharge of 20° C effluent into the marine water at 8° C will result in a temperature change of less than 0.1° C. Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limit of 6 to 9 will assure compliance with the water quality standard of 7 to 8.5 in the receiving water.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 458.1. The dilution would reduce the bacteria to less than one (440/458.1). Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

¹¹ Henke, Engineering Report, pg. 18.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, arsenic, chromium, copper, lead, selenium, and zinc. The Permittee also tested for antimony, beryllium, cadmium, mercury, nickel, silver, and thallium during the last five years. These pollutants were not found in the effluent. A reasonable potential analysis (see Appendix C, Table 5) was conducted on the pollutants detected in the effluent to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for the detected pollutants listed in the preceding paragraph to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (see Appendix C, Table 5) at the critical condition as defined in the effluent mixing study.¹² The parameters used in the critical condition modeling are as follows: acute dilution factor 54.8, chronic dilution factor 458.1.

Effluent limits were derived for **CHLORINE**, which was determined to have a reasonable potential to cause a violation of the water quality standards. Effluent limits were calculated using methods from EPA, 1991, as shown in Appendix C, Table 6.

The resultant effluent limits are as follows:

	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)
Chlorine	0.36 mg/L, 21 lbs./day	0.71 mg/L

Monthly effluent mass loadings (lbs./day) were calculated as the maximum monthly design flow (7.1 MGD) x concentration limit (0.36 mg/L) x 8.34 (conversion factor) = mass limit **21 lbs./day**.

The corresponding maximum daily limit for chlorine is 0.71 mg/L. The MDL is the highest allowable daily discharge of chlorine.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

¹² Henke, Engineering Report, Outfall Analysis and Mixing Zone Study.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center (360-407-7472) for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

An effluent characterization for acute and chronic toxicity was conducted during the previous permit term. In accordance with WAC 173-205-060, the Permittee must repeat this effluent characterization for the following reason:

The average dry weather flow volume has changed by ten percent or more due to changes in plant processes which resulted in approximately 25% increase in average daily design flow. In accordance with WAC 173-205-060(1), the proposed permit requires another effluent characterization for toxicity.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on the discharger's status as a major discharger.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) and the Department's *Permit Writer's Manual* (Ecology Publication 92-109, July 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge does have a reasonable potential to violate the sediment management standards for both copper and zinc, Appendix C, Table 8: Potential for Sediment Contamination. However, during the previous permit cycle, the Permittee conducted a Sediment Baseline Analysis (February 1997) which showed no pattern of sediment contamination. No additional sediment analysis is required during this permit.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated ground water quality standards (chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100). This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

**COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED
JUNE 23, 1997**

<i>Parameter</i>	<i>Existing Limits</i>	<i>Proposed Limits</i>
BOD ₅	<u>monthly average</u> 30 mg/L, 1535 lbs./day <u>weekly maximum</u> 45 mg/L, 2300 lbs./day	<u>monthly average</u> 30 mg/L, 1776 lbs./day <u>weekly maximum</u> 45 mg/L, 2665 lbs./day
TSS	<u>monthly average</u> 30 mg/L, 1535 lbs./day <u>weekly maximum</u> 45 mg/L, 2300 lbs./day	<u>monthly average</u> 30 mg/L, 1776 lbs./day <u>weekly maximum</u> 45 mg/L, 2665 lbs./day
pH	shall be within the range of 6 to 9 standard units	shall be within the range of 6 to 9 standard units
Fecal Coliform Bacteria	<u>monthly average</u> 200/100 mL <u>weekly maximum</u> 400/100 mL	<u>monthly average</u> 200/100 mL <u>weekly maximum</u> 400/100 mL
Total Residual Chlorine	0.15 mg/L monthly average 7.7 lbs./day monthly average 0.39 mg/L daily maximum	0.36 mg/L monthly average 21 lbs./day monthly average 0.71 mg/L daily maximum

The proposed pound per day (lb/day) limit for BOD₅ and TSS increased due to the increase in the maximum monthly average design flow as compared to the previous permit.

The proposed monthly average and daily maximum limits for chlorine (mg/L) increased due to mixing zone analysis conducted since the last permit. The new modeling of the mixing zone resulted in larger acute and chronic mixing zone allowing for an increase in allowable chlorine in the discharge. The proposed increase of the monthly average chlorine discharge in pounds/day (lbs./day) resulted from the increase in the maximum monthly average design flow as compared to the previous permit.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 2002) for rotating biological contactor (RBC) facility of greater than 2 MGD design flow with a partial reduction for exemplary performance.

Ecology's *Permit Writer's Manual* (July 2002) allows for a reduction in monitoring frequency on the basis of performance. The reduced frequency is determined by the ratio of the long term average (LTA) to the average monthly limit (AML). The results of the analysis as shown are based on the DMR data submitted for the 2-year period from June 2000 to July 2002 for both BOD and TSS.

Pollutant	LTA (mg/L)	AML (mg/L)	Ratio (LTA/AML)	Allowable Minimum Monitoring Frequency for ratio 25%-49% ¹³
BOD ₅	14	30	47%	1/week
TSS	7.7	30	26%	1/week

The monitoring requirement for both BOD₅ and TSS is set at **2/week**. This determination was made based on (1) that it is more comparable to the requirement for other facilities of similar design and flow and (2) that it aligns with the sample frequency of the Permittee over the last year of the previous permit cycle.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for:

Biological Oxygen Demand
Total Suspended Solids
Fecal Coliform
Dissolved Oxygen and pH

¹³ Ecology *Permit Writer's Manual*, p. XIII-15.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATIONS AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The Department requires the Permittee to update their *Operations and Maintenance Manual* (current version 1988) to ensure that it provides accurate and up-to-date information. Refer to the permit for the specific date the update is required.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the King County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program [i.e., act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g., tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing state waste discharge permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)]. (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a state waste discharge permit sixty (60) days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g., tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a state waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

Annual Submittal of List of Industrial Users

This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Documents received by the Department from Southwest Suburban Sewer District

EPA NPDES Form 2A Application

Henke, Evan P.E., CHS Engineer, Inc., Miller Creek WWTP Engineering Report, February 2001

Henke, Evan P.E., CHS Engineer, Inc., Miller Creek/Salmon Creek WWTP Improvements, May 2002.

Horton, Dennis and Associates, Southwest Suburban Sewer District 1999 Comprehensive Sewer Plan, February 1999.

Standard Reference Documents

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse, Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

2002. Permit Writer's Manual. Publication Number 92-109.

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on September 4, 2001, and September 11, 2001, in the *Seattle Times* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on March 17, 2003, in the *Seattle Times* to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 425-649-7201, or by writing to the address listed above.

This permit and fact sheet were written by Karen Burgess.

APPENDIX B—GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART--An acronym for “all known, available, and reasonable methods of prevention, control, and treatment.”

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation--The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅--The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring--Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference--A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) [including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA], sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of >80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of <80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/state permits issued under both state and federal laws.

Pass Through--A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of state water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an industrial user which does not meet the criteria for a significant industrial user, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day; or
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g., facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)--A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1. All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subchapter N; and
2. Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

List of Tables

Table 1:	Miller Creek WWTP Influent DMR Data for 7/1/97 to 7/1/02
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Table 3:	Water Quality Criteria Worksheet
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Table 5:	Reasonable Potential Calculation
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FACT SHEET FOR NPDES PERMIT WA-002276-4

FACILITY NAME: SOUTHWEST SUBURBAN SEWER DISTRICT~MILLER CREEK WWTP

APPENDIX D—EPA NPDES APPLICATION (PART D) TESTING REQUIREMENTS

The following pollutant scan data are required at the time of NPDES permit application for municipal treatment facilities with design flow greater than 1.0 mgd. At least three scans are required, conducted during the term of the previous permit.

METALS & MISC.	VOL. ORGANICS (Cont.)	BASE NEUTRALS (Cont.)
Antimony	Ethylbenzene	Bis (2-Chloroethyl)-Ether
Arsenic	Methyl Bromide	Bis (2-Chloroiso-Propyl) Ether
Beryllium	Methyl Chloride	Bis (2-Ethylhexyl) Phthalate
Cadmium	Methylene Chloride	4-Bromophenyl Phenyl Ether
Chromium	1,1,2,2-Tetrachloro-Ethane	Butyl Benzyl Phthalate
Copper	Tetrachloro-Ethylene	2-Chloronaphthalene
Lead	Toluene	4-Chlorophenyl Phenyl Ether
Mercury	1,1,1-Trichloroethane	Chrysene
Nickel	1,1,2-Trichloroethane	Di-N-Butyl Phthalate
Selenium	Trichlorethylene	Di-N-Octyl Phthalate
Silver	Vinyl Chloride	Dibenzo(A,H) Anthracene
Thallium		1,2-Dichlorobenzene
Zinc	ACID EXTRACTABLES	1,3-Dichlorobenzene
Cyanide	P-Chloro-M-Cresol	1,4-Dichlorobenzene
Total Phenolic Compounds	2-Chlorophenol	3,3-Dichlorobenzidine
Hardness (As CaCO ₃)	2,4-Dichlorophenol	Diethyl Phthalate
	2,4-Dimethylphenol	Dimethyl Phthalate
VOLATILE ORGANICS	4,6-Dinitro-O-Cresol	2,4-Dinitrotoluene
Acrolein	2,4-Dinitrophenol	2,6-Dinitrotoluene
Acrylonitrile	2-Nitrophenol	Fluoranthene
Benzene	4-Nitrophenol	Fluorene
Bromoform	Pentachlorophenol	Hexachlorobenzene
Carbon Tetrachloride	Phenol	Hexachlorobutadiene
Chlorobenzene	2,4,6-Trichlorophenol	Hexachlorocyclo-Pentadiene
Chlorodibromo-Methane		Hexachloroethane
Chloroethane	BASE NEUTRALS	Indeno(1,2,3-CD)Pyrene
2-Chloro-Ethylvinyl Ether	Acenaphthene	Isophorone
Chloroform	Acenaphthylene	Naphthalene
Dichlorobromo-Methane	Anthracene	Nitrobenzene
1,1-Dichloroethane	Benzidine	N-Nitrosodi-N-Propylamine
1,2-Dichloroethane	Benzo(A)Anthracene	N-Nitrosodi-Methylamine
Trans-1,2-Dichloro Ethylene	3,4 Benzo-Fluoranthene	N-Nitrosodi-Phenylamine
1,1-Dichloroethylene	Benzo(Ghi)Perylene	Phenanthrene
1,2-Dichloropropane	Benzo(K)Fluoranthene	Pyrene
1,3-Dichloro-Propylene	Bis (2-Chloroethoxy) Methane	1,2,4-Trichlorobenzene

APPENDIX E—RESPONSE TO COMMENTS

No comments were received during the public comment period.